Description and life history of *Eustrotia vittata* spec. nov. (Lepidoptera: Noctuidae) from Northern Nigeria

by

M. W. SERVICE

Malaria Unit, Ministry of Health, Kaduna, N. Nigeria)*

During a study of the ecology of the fauna in water filled rock pools in a granite outcrop in the Northern Guinea Savannah vegetation in Northern Nigeria (Keay, 1953), lepidopterous larvae were observed feeding on an aquatic plant growing in these pools. It was subsequently discovered that they represent a new species of Noctuidae, and a description of the species and an outline of its life history is presented here.

Eustrotia vittata spec. nov., plate 3, fig. 1, text figs. 1-4.

MALE: Wing span 16.5 mm. Head with frons and vertex thickly covered with white scales, those of vertex semi-erect. White scales on thorax decumbent, extending onto bases of forewing. Palpi about 1.5 diameter of eye, covered with white scales, but on outer side dark and flavous ones also present. Antennae about 0.6 length of forewing, with white scales at base, remainder with irregular rows of light and darker appressed scales, giving antennae a dark appearance to naked eye but ringed under magnification, very finely setose especially on ventral surface. Wings with ground colour white, forewings with well defined pattern of brown, black and flavous scales and also a few silver-grey ones, markings on hind wing fainter, composed of brown scales (pl. 3, fig. 1). Apices of veins in both wings defined by a distinct line of brown scales, distal to which is a fringe of long narrow white scales. Underside of wings darker and with the pattern more diffuse, the dark scales being brown, flavous scales confined to a narrow line on edge of costa of forewing. Legs thickly covered with white scales, dark scales and a few flavous ones are also present, these give the tarsi a ringed appearance. Well developed spines on hind femora, hind and mid tibiae. Abdomen covered dorsally and ventrally with white appressed scales, those of terminal segment long, narrow and flavous; narrow dark anterior bands of scales seen on each segment if abdomen is extended. Both sexes grease rapidly and the thorax and abdomen become black.

---

*) Present address: The Nature Conservancy, Furzebrook Research Station, Wareham, Dorset, England.

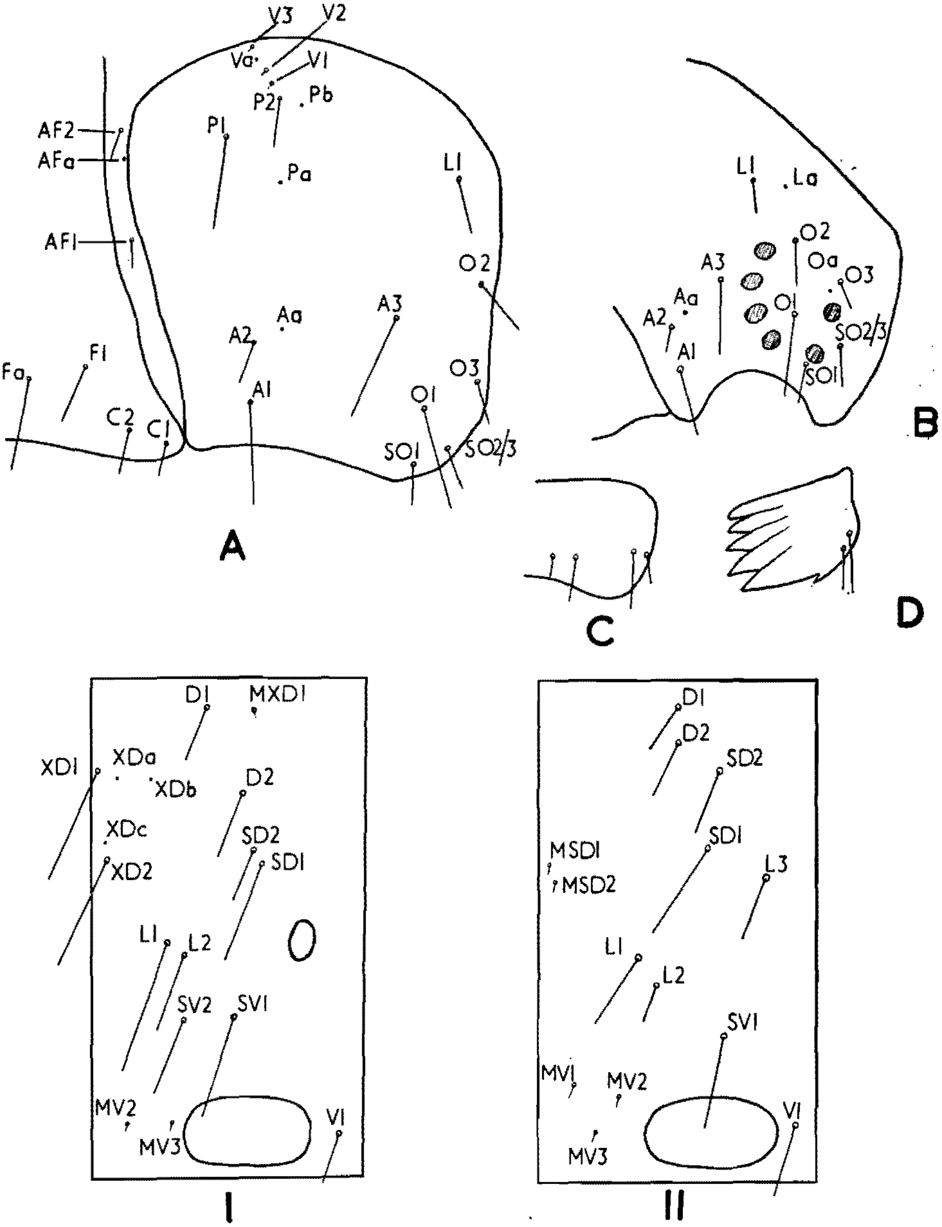


Fig. 1. Chaetotaxy of *Eustrotia vittata* spec. nov. A-D, head and mandible; I and II, thoracic segments.

In the genitalia the valvae simple with distinct clavus at 1/3 from base, aedeagus with a single spined cornutus and well sclerotized carina penis, anellus spiculate (fig. 3b).

FEMALE: External appearance as in male. The bursa copulatrix large and medially constricted with small oval shaped spiculated signum; genital duct with membranous median projection anteriorly, mid-part of ductus bursae more heavily sclerotized (fig. 4).

OVA: White, hemispherical, with 23 longitudinal ribs, their apices diffuse, seven to ten small horizontal cross striations between these ribs. Basal diameter 0.5 mm, greatest height 0.3 mm.

LARVA: Length of final instar larva about 13-18 mm, breadth 1.5-1.9 mm. Mature specimens usually lime-green dorsally and dorsolaterally, ventrally a much paler green. Many specimens have in addition diffuse red markings dorsally on the thoracic and abdominal segments; prior to pupation the larva turns red. Immature larvae are red dorsally and dorsolaterally but green ventrally. The red colouration tends to persist in alcohol preserved specimens, all green coloration, however, disappears. Head about as long as broad, greatest width just above the six ocelli which are arranged as shown in fig. 1 B. Mandibles with five main teeth and one to two small subsidiary ones (fig. 1 D). Spiracles have brown perimeters; all three pairs of prolegs equal in size, crochets 20 in number, uniform in size and in a complete ring. Chaetotaxy as illustrated in figs. 1 and 2.

PUPA: Length 7 mm, greatest breadth 2.8 mm. Head, wing cases and thorax olive-green in colour when first formed, but after one to two days pupa turns light brown. Devoid of hairs and bristles except for a short bristle on each side of clypeus and three on either side of cremaster. Abdominal segments 6-8 with basal areas covered dorsally and ventrally with numerous small round pits.

♂-Holo- and ♀-allotype: Anara (10°.34′ N., 07°.34′E), N. Nigeria, October 1962; 12 ♂ - and 10 ♀-paratypes: as types, November-December, 1962. and August-September, 1963.

Ovae: alcohol preserved, 17 ovae, September 1962; 11 ovae, June 1963 and 18 ovae, July 1963.

Larvae: one larval skin, July 1962, six larvae and skins, October 1962; four larval skins, August 1963 and one larval skin, November 1963.

Pupae: those with associated larval skins as above; one pupal pelt, October 1962 and one pupal pelt, December 1962.

All type material has been deposited in the British Museum (Nat. Hist.), London, except for one ♂- and one ♀-paratype which have been presented to the Transvaal Museum, Pretoria.

This species derives its name from the fact that its food plant, *Dopatrium longidens* Skan. (Scrophulariaceae), is an aquatic plant restricted to rock pools, see plate 3, fig. 2.

PLATE 3

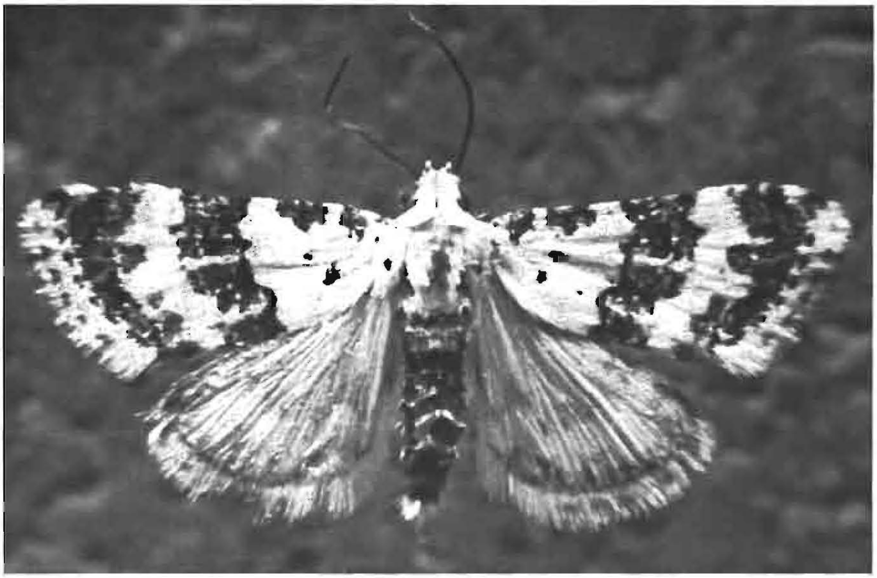


Figure 1. *Eustrotia vittata* spec. nov. ♂-Holotype.

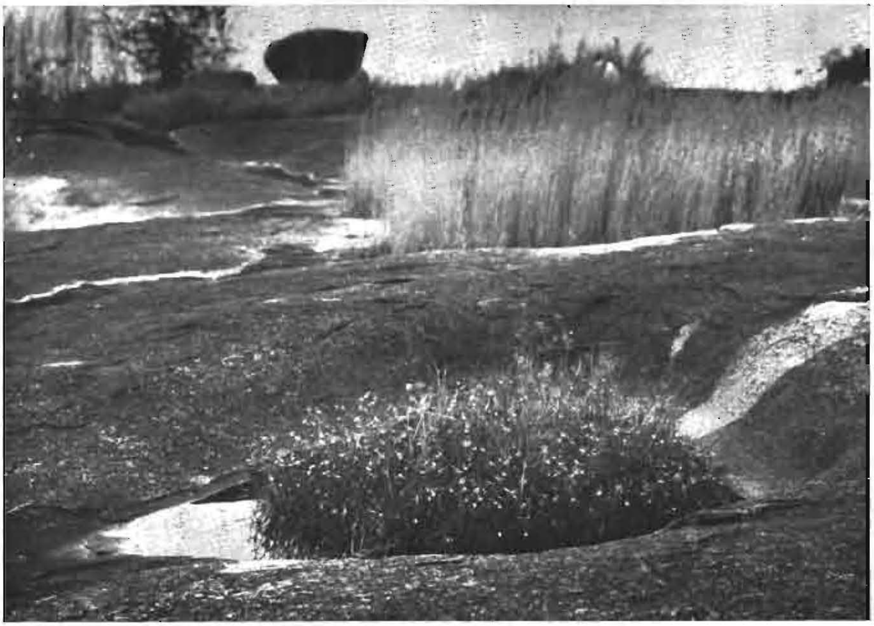


Figure 2. Habitat of *Eustrotia vittata* spec. nov. Rock pool with Dopatrium longidens Skan at Anara, N. Nigeria.

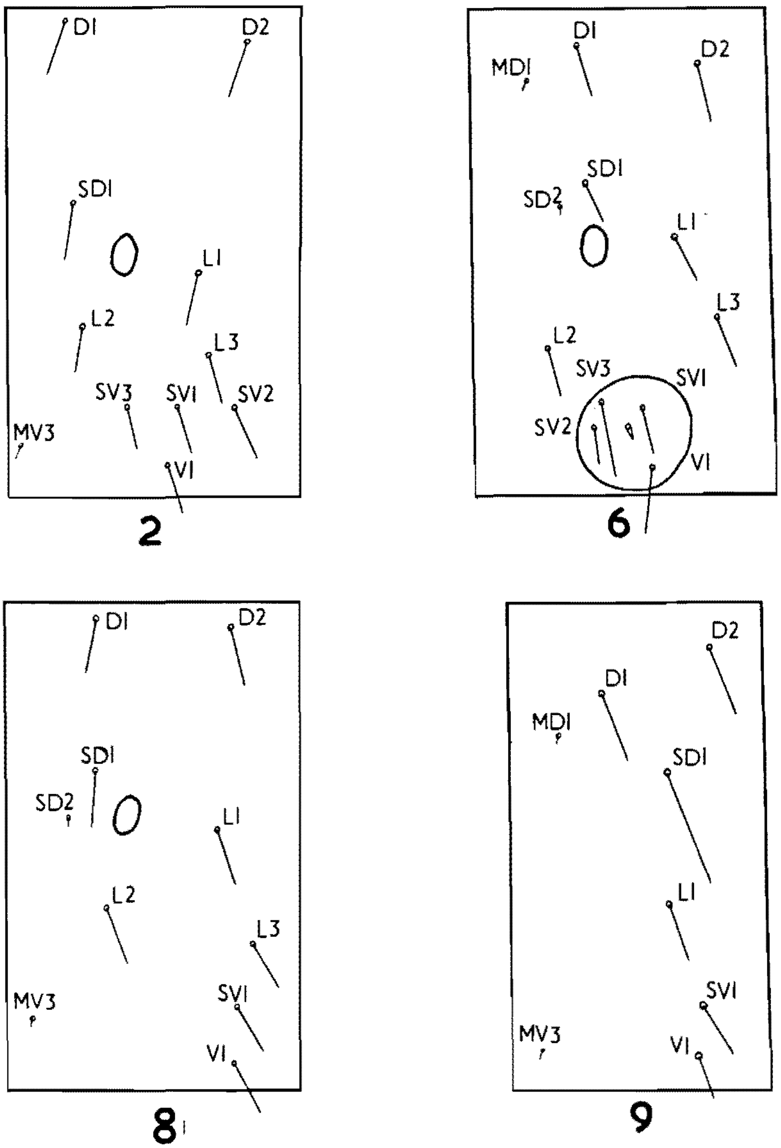


Fig. 2. Chaetotaxy of *Eustrotia vittata* spec. nov. Abdominal segments 2, 6, 8 and 9.

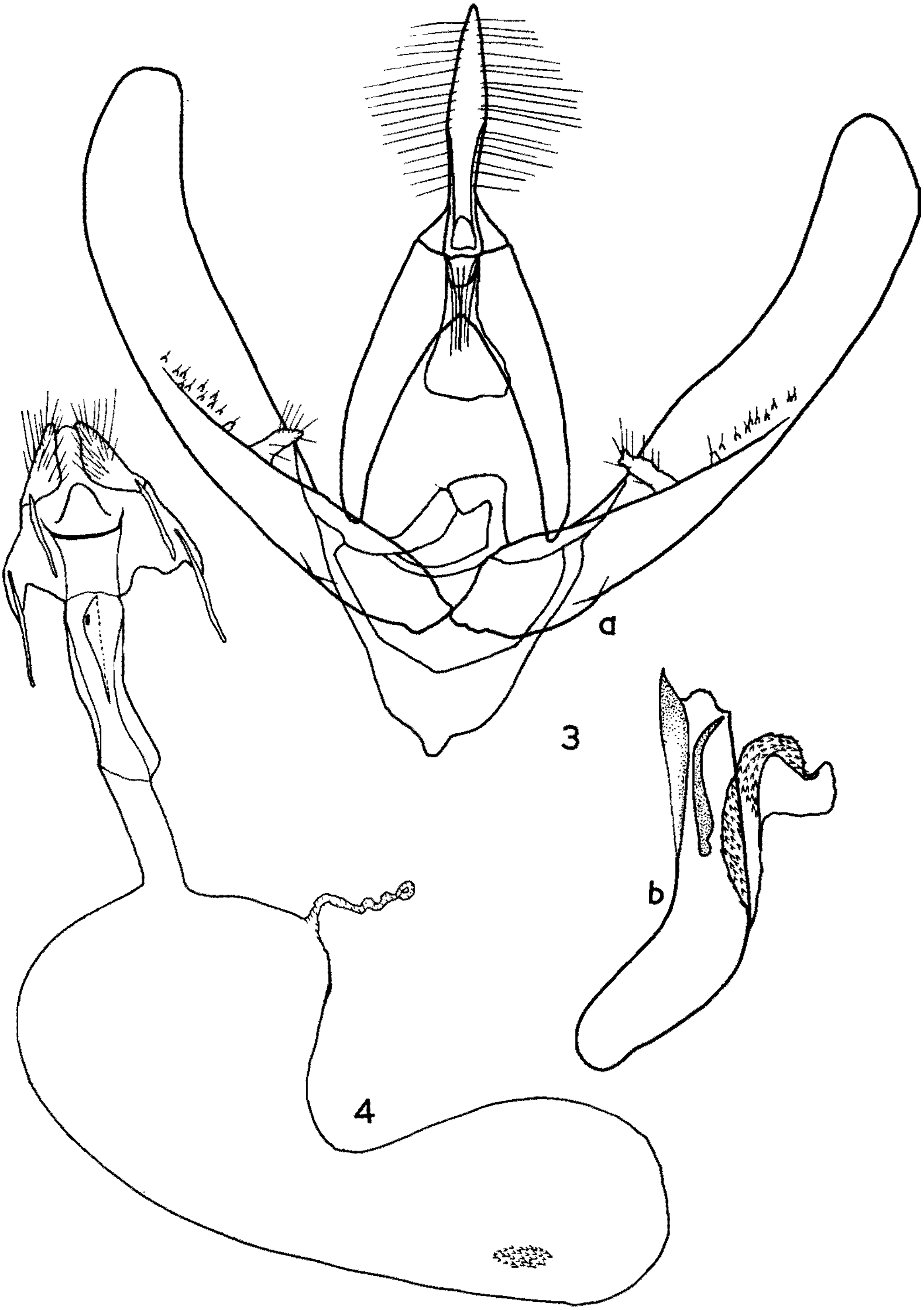
LIFE HISTORY: The food plant, *D. longidens*, which is recorded only from Segou in Mali and from a few localities in the Northern Guinea Savannah of Nigeria, is an annual and is restricted to water filled rock pools found on exposed granite outcrops (fig. 6). It persists in the dry season as seeds in the dry mud at the bottom of the pools. In the area under consideration the rock pools become full of water in about May and the first young shoots of the plant appear in late May or early June, and about three weeks later they emerge through the water surface, and finally reach a height of 4-7 ins. after another month. The rainy season ends in about October and although many of the pools still contain water for a further two to three weeks, the plants die down.

The first adults and eggs of *E. vittata* which are deposited a few inches above the water level on the plant stems in batches of 16-27 in two to three regular rows, appear in early July. The eggs hatch within two days and the first instar larvae do not eat the empty egg shells but start to feed on the young plant stems. Under laboratory conditions the larval life lasted 15-18 days and when supplied with earth the final instar larvae buried themselves to a depth of 2-3 ins. for pupation. Field observations show that when larvae have eaten a plant stem down to about water level, and there are no other adjacent stems for them to crawl onto, they swim across the water surface by sinous lateral movements until they reach and climb up other plants. Further evidence of this aquatic adaptation is shown by the following collecting method. Larvae are difficult to locate on the plants because of their cryptic coloration, so after a preliminary examination the plants are submerged and after a short interval the larvae detach themselves and swim across the water surface and are consequently easily seen and collected. Occasionally larvae were observed to swim away from the plants and crawl out of the pools onto the rock outcrop, and it is considered that this offers the only means by which the final instar larvae can escape from the water filled rock pools for pupation. It is most unlikely that larvae pupate in the mud at the bottom of the pools as these usually still contain water two to three weeks after the plants have died down. In fact, no pupae were found in mud collected from these pools during three successive dry seasons; however, after much searching two live pupae were found on 2.XII.1962 amongst earth and grass roots at the edges of the granite outcrop; adults emerged on 15 and 27.VI.1963.

Presumably the first eggs of the season, which were found in July, were those of adults that had emerged in about June from overwintering pupae, while eggs found in September obviously constitued a distinct brood. Larvae collected early in the season, June — August, pupated within a short time and emergence occurred a few days later, but most of the larvae found at the end of the rains, October, pupated within a few days but emergence took place the following June.

EXPLANATIONS OF FIGURES

Figs. 3-4. *Eustrotia vittata* spec. nov. Fig. ♂-Genitalia; Fig. 4 ♀-Genitalia.


a
3
b
4

A few, however emerged 10-11 days after pupation, but the warmer and more humid environment of the laboratory was probably responsible for this premature emergence. It is evident that the species is multi-brooded, the final one surviving the very severe dry season in the pupal state.

Other lepidopterous larvae that were found feeding on the host plant include those of *Precis orithya* L. (Nymphalidae) and a new species of *Platyptilia* (Pterophoridae), which will be described separately. Pupae of these species are attached to the plant stems. Although several pupal cases of a hymenopterous parasite, *Micoplitis* species (Braconidae), were found attached to the stems of the plants, none of the reared larvae was parasitized.

ACKNOWLEDGEMENTS

I wish to thank Dr I. W. B. Nye and Mr D. S. Fletcher of the British Museum (Nat. Hist.), London, for guidance in the preparation of this paper. Thanks are due to the Permanent Secretary, Ministry of Health, Kaduna, N. Nigeria, for permission to publish this paper.

REFERENCES

KEAY, R. W. J., 1953. An outline of Nigerian vegetation. Govt. Printer, Nigeria, 55 pp.